

SEQUENCE LISTING

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TECH CENTER 1600 2900

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-110> Ayyavoo, Velpandi
Patel, Mamata
Kieber-Emmons, Thomas
Weiner, David B.
Mahalingam, Sundaramy
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- \cdot 120> Functional Fragments of HIV-1 VPR Protein and Methods of Using the Same
- <130> UPN-4023
- <140> 09/485,421
- · 1410 2000-10-05
- <150: 60/055,754</pre>
- -151: 1997-05-14
- 160: 18
- <1700 PatentIn Ver. 2.1
- <2100 1
- <211: 96
- <2120 PRT
- <2130 Artificial Sequence</p>
- 220
- +223 > Description of Artificial Sequence: Novel Sequence
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- Met Glu Glr. Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Tyr Pro Asn
 1 5 10 15
- Asp Trp Thr Leu Glu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg 20 25 30
- His Phe Prc Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu 35 40 45
- Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu 50 60
- Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg 65 70 75 80
- lle Gly Ile Ile Gl
n Gl
n Arg Arg Thr Arg As
n Gly Ala Ser Lys Ser $90 \ 95$

^{- 210&}gt; 2

^{+ 2115 101}

⁻²¹²⁵ PRT

^{+213&}gt; Artificial Sequence

- 220 -

+ 223 * Description of Artificial Sequence: Novel Sequence

- 400 - 2

Met Glu Glu Arg Pro Pro Glu Asn Glu Gly Pro Gln Arg Glu Pro Trp

Asp Glu Trp Val Val Glu Val Leu Glu Glu Leu Lys Glu Glu Ala Leu 20 25 30

Lys His Phe Asp Pro Arg Leu Leu Thr Ala Leu Gly Asn His Ile Tyr 35 40 45

Asn Arg His Gly Asp Thr Leu Glu Gly Ala Gly Glu Leu Ile Arg Ile 50 55 60

Leu Gln Arg Ala Leu Phe Met His Phe Arg Gly Gly Cys Ile His Ser 65 70 75 80

Arg Ile Gly Gln Pro Gly Gly Gly Asn Pro Leu Ser Ala Ile Pro Pro 85 90 95

Ser Arg Ser Met Leu 100

+210: 3

 $+2311 \times -111$

+212: PRT

+213> Artificial Sequence

., 0005

<223> Description of Artificial Sequence: Novel Sequence

-400> 3

Met Thr Asn Pro Arg Glu Thr Ile Pro Pro Gly Asn Ser Gly Glu Glu 1 5 16

Thr Ile Glu Glu Ala Phe Asp Trp Leu Asp Arg Thr Val Glu Ala Ile 20 25 30

Asn Arg Glu Ala Val Asn His Leu Pro Arg Glu Leu Ile Phe Gln Val 35 40 45

Trp Gln Arg Ser Trp Arg Tyr Trp His Asp Glu Gln Gly Met Ser Arg
50 55 60

Ser Tyr Thr Lys Tyr Arg Tyr Leu Cys Leu Met Gln Lys Ala Val Phe -65 70 75 80

Met His Phe Lys Lys Gly Dys Thr Dys Arg Gly Glu Gly His Gly Pro 85 90 95

Gly Gly Trp Arg Ser Gly Pro Pro Pro Pro Pro Pro Pro Gly Leu 100 105 110 + 2.10% 4 5.11127-96 HOLLE PRT +213 Artificial Sequence 4.2205 AMM38 Description of Artificial Sequence: Novel Sequence <400>4Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu 55 Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg 65 The Gly The The Gln His Arg Arg Thr Arg Ash Gly Ala Ser Lys Ser 85 90 +(210:5)4211: 96 <212 PRT <213> Artificial Sequence <220> <223> Description of Artificial Sequence: Novel Sequence <4005 5 Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Leu Pro Leu Leu Pro Glu Leu Lys Asn Glu Ala Val Arg 2.0 His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu 57) 55 Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg

The Gly Hie Hie Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser

32115 96 42109 PRT <213 Artificial Sequence 4.220% <223 - Description of Artificial Sequence: Novel Sequence</p> 3400 × 6 Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Ala Gl. Ala Ala Glu Glu Ala Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg Ile Gly Ile Ile Glr. His Arg Arg Thr Arg Asn. Gly Ala Ser Lys Ser <2105 7 <2119 96 4212 + PRT<213 · Artificial Sequence <2200 <223 - Description of Artificial Sequence: Novel Sequence Met Glu Glr Ala Pro Glu Asp Gln Gly Pro Glr Arg Glu Pro Tyr Asn 10 Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ser Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg 70 65 Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser 2 Dila 2 8 3 D11 3 G0

+212> PRT

- 2135 Artificial Sequence

+ 0205

+223> Description of Artificial Sequence: Novel Sequence

- 4005 8

M-t Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn 1 5 13

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Leu V4l Arg 20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly 3ln His Ile Tyr Glu 35 40 45

Thr Tyr Gly Asp Thr Trp Thr Sly Val Glu Ala Leu Ile Arg Ile Leu 50 55 60

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg 65 70 75 80

Ile Gly Ile Ile Glr. His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser 85 90 95

+210> 9

- 211> 96

<212> PRT

+213> Artificial Sequence

- 220>

+323> Description of Artificial Sequence: Novel Sequence

<400> 9

Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn
1 5 10 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg 20 25 30

Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Pro Leu Ile Arg Ile Leu 50 55

Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Gys Arg His Ser Arg 75 75

 Ile Gly Ile Ile Gl
n. His Arg Arg Thr Arg As
n Gly Ala Ser Lys Ser $90\,$ 95

 $+11100\cdot\ 10$

-.1115 96

- 2125 PRT

0013 - Artificial Sequence - 220 s +323 - Description of Artificial Sequence: Novel Sequence <400 + 10Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Glr Arg Glu Pro Tyr Asn Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu 4.0 The Tyr Gly Asp The Trp Thr Gly Val Glu Ala Leu Ile Arg Ser Leu 5.5 Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg 7 ō The Gly The The Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser <210% 11 <2115 96 -212 - FRT ×213 Artificial Sequence K220E <223 Description of Artificial Sequence: Novel Sequence <400> 11 Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn $-1 \circ$ Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Ser Leu Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg £ 5 Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser 90

 $\times \, \mathbb{S} \, 10 \times \, 10$

^{· 1111 - 46}

^{+212 +} FRT

⁺⁰¹³ Artificial Sequence

3 1200 at

+ 223> Description of Artificial Sequence: Novel Sequence

- 40005 12

Met Glu Gl
n Ala Pro Glu Asp Gl
n Gly Pro Gl
n Arg Glu Pro Tyr As
n 10 $^{\circ}$ 15

Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg 20 25 30

His Fhe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu 35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly Mal Glu Ala Leu Ile Arg Ile Leu 50 55 60

Gln Gln Leu Ser Phe Ile His Phe Arg Ile Gly Cys Arg His Ser Arg 65 70 75 80

Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser 85 90 95

<210> 13

3211> 96

+212> PRT

+213> Artificial Sequence

- DE0>

+ 223 > Description of Artificial Sequence: Novel Sequence

+ 400> 13

Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn 1 5 10 15

Asp Trp Thr Leu Glu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg 20 25 30

His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu 35 40 45

Thr Tyr Gly Asp Thr Trp Thr Gly 'al Glu Ala Leu Ile Arg Ile Leu 50 55 60

Gln Gln Leu Leu Phe Ile Cys Phe Arg Ile Gly Cys Arg His Ser Arg -65 70 75 80

He Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser 85 90 95

+ 510> 14

+2115 9F

HUIDS PPT

-..13> Artificial Sequence

+2230 Description of Artificial Sequence: Novel Sequence <4000<14Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn 10 Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His The Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu The Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu 5.5 Gln Gln Leu Leu Phe Ile Tyr Phe Arg Ile Gly Cys Arg His Ser Arg Ile Gly Ile Ile Gln His Arg Arg Thr Arg Asn Gly Ala Ser Lys Ser <2100-15 <211 - 96 4212: PRT <2135 Artificial Sequence d2205 <223 Description of Artificial Sequence: Novel Sequence</p> Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn C· 1 Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile His Phe Arg Ile Ala Cys Arg His Ser Arg 65 The Gly He He Gln His Arg Arg Thr Arg Ash Gly Ala Ser Lys Ser 30 F2195-16

227 11

+211+96 +212+ PRT

+213 Artificial Sequence

3.220 ×

+ 2230 Description of Artificial Sequence: Novel Sequence -4005 16 Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Thr Trp Thr Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile His Phe Arg Ile Gly Ser Arg His Ser Arg 7(: The Gly The The Glr. His Arg Arg Thr Arg Ash Gly Ala Ser Lys Ser +210 > 17+ 211> 78 +212> PRT R213R Artificial Sequence +223> Description of Artificial Sequence: Novel Sequence +4000-17 Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Pro Tyr Asn Asp Trp Thr Leu Glu Leu Leu Glu Glu Leu Lys Asn Glu Ala Val Arg 20 His Phe Pro Arg Ile Trp Leu His Ser Leu Gly Gln His Ile Tyr Glu Thr Tyr Gly Asp Ile Trp Ile Gly Val Glu Ala Leu Ile Arg Ile Leu Gln Gln Leu Leu Phe Ile His Phe Gln Asn Trp 'al Ser Thr 70 +210+ 19 -211- 96 -2123 PRT 213 Artificial Sequence $\pm 0.03 \pm 0$ escription of Artificial Sequence: Novel Sequence + 4000 - 18 Met Glu Gln Ala Pro Glu Asp Gln Gly Pro Gln Arg Glu Tyr Pro Asn